

## Abstract

The fuel injection system has a respective high-pressure fuel pump (10) and a fuel injection valve (12) connected to it for each cylinder of the internal combustion engine. A first electrically actuated control valve (60) controls a connection (21) of the pump working chamber (22) to a low-pressure region (25) and a second electrically actuated control valve (62) controls a connection (57) of a control pressure chamber (52) of the fuel injection valve (12) to a relief region. In addition, a pressure reservoir (68) is provided, which is filled by the high-pressure fuel pump (10) and from which fuel can be withdrawn in order to execute a fuel injection with the fuel injection valve (12) independent of the delivery from the high-pressure fuel pump (10). The connection (66) of the pressure reservoir (68) to the high-pressure fuel pump (10) and the fuel injection valve (12) contains a coupling device (70) that has a piston (74) that is guided in a sliding fashion and is acted on at one end by the pressure prevailing in the pressure reservoir (68) and is acted on at the other end by the pressure prevailing in the connection (66), that the piston (74) executes a delivery stroke oriented toward the pressure chamber (40) in order to execute a fuel injection, and that the coupling device (70) contains a bypass connection (76, 77) via which the connection (66) communicates with the pressure reservoir (68).

542, 317



**(10) Internationale Veröffentlichungsnummer**  
**WO 2004/070201 A1**

**Hans-Christoph** [DE/DE]; Bachstrasse 10, 72793  
Pfullingen (DE).

**(74) Gemeinsamer Vertreter: ROBERT BOSCH GMBH;**  
Postfach 30 02 20, 70442 Stuttgart (DE).

**(81) Bestimmungsstaat (*national*):** US.

**(84) Bestimmungsstaaten (regional):** europäisches Patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).

**Veröffentlicht:**  
— mit internationalem *Recherchenbericht*

Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

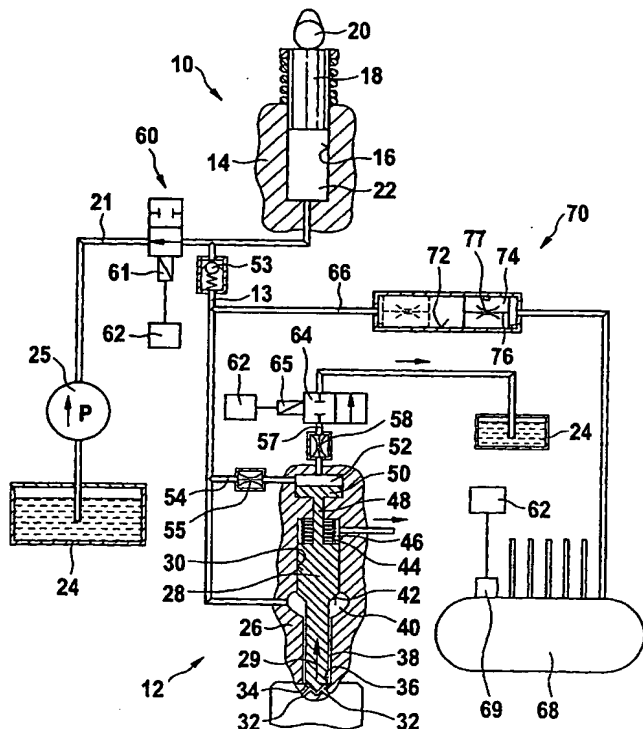
Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.



**(57) Abstract:** The fuel injection device comprises a fuel high-pressure pump (10) and a fuel injection valve (12), which is connected thereto, for each cylinder of the internal combustion engine. A connection (21) of the pump working chamber (22) to a low pressure area (25) is controlled by a first electrically actuated control valve (60), and a connection (57) of a control pressure space (52) of the fuel injection valve (12) to a pressure relief area is controlled by a second electrically actuated control valve (62). In addition, a pressure accumulator (68), which is filled by the fuel high-pressure pump (10), and from which fuel can be removed for a fuel injection, which is independent from the delivery of the fuel high-pressure pump (10) and which is effected via the fuel injection valve (12). A coupling device (70) is placed in the connection (66) of the pressure accumulator (68) to the fuel high-pressure pump (10) and to the fuel injection valve (12). This coupling device has a displaceably guided plunger (74), which, on one side, is subjected to the action of pressure prevailing inside the pressure accumulator (68) and, on the other side, by the pressure prevailing inside the connection (66). This pressure acts upon the plunger (74) in such a manner that the plunger, for injecting fuel, executes a delivery stroke directed toward the pressure space (40) and that a bypass connection (76, 77) exists in the coupling device (70) that connects the connection (66) to the pressure accumulator (68).

[Fortsetzung auf der nächsten Seite]

**WO 2004/070201 A1**